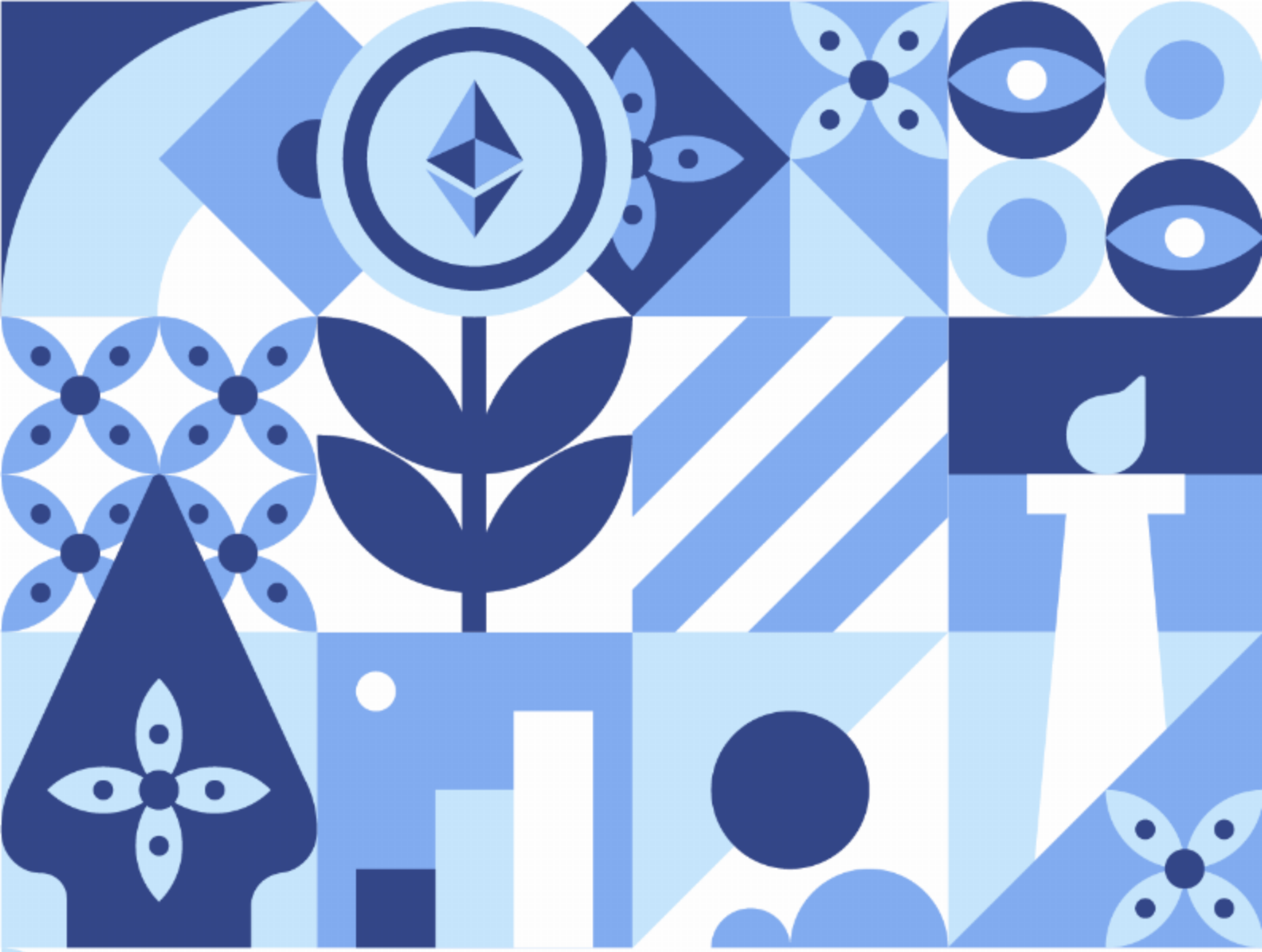

Spherium Token

Smart Contract Audit Report

SYSFIXED

21 Jun 2021

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
Spherium Token	SPHRI	Ethereum

Addresses

Contract address	0x8a0cdfab62ed35b836dc0633482798421c81b3ec
Contract deployer address	0x7a6C9e8b7F0A9cf993eD8c6A4a42FD7fD3bb435A

Project Website

https://spherium.finance/#/

Codebase

https://etherscan.io/address/0x8a0cdfab62ed35b836dc0633482798421c81b3ec#code

SUMMARY

Spherium Finance is an all-in-one DeFi platform that empowers the financial ecosystem by unifying the current scattered Decentralized Finance landscape. Spherium utilizes the principles of forecasting, investing, lending, and borrowing to provide a single platform for multi-asset, cross-chain swaps, bridges, crypto financing solutions, and cross-chain interoperability. Spherium is set to make DeFi accessible for Institutions and Users alike, all the while developing an umbrella of decentralized, cross-chain, and interoperable protocols to bridge the gap created by a plethora of blockchains and token facilitating projects.

Contract Summary

Documentation Quality

Spherium Token provides a very good documentation with standard of solidity base code.

- The technical description is provided clearly and structured and also dont have any high risk issue.

Code Quality

The Overall quality of the basecode is standard.

- Standard solidity basecode and rules are already followed by Spherium Token with the discovery of several low issues.

Test Coverage

Test coverage of the project is 100% (Through Codebase)

Audit Findings Summary

- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 9, 36, 106, 186, 215, 521, 559, 776, 784 and 818.
- SWC-120 | It is recommended to use external sources of randomness via oracles on lines 939, 1122 and 1195.

CONCLUSION

We have audited the Spherium Token project released on January 2023 to discover issues and identify potential security vulnerabilities in Spherium Token Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides a satisfactory result with some low-risk issues.

The issues found in the Spherium Token smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are some a floating pragma is set and weak sources of randomness. The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gas limit, block number, and timestamp are predictable and can be manipulated by a malicious miner. Also, keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that the use of these variables introduces a certain level of trust in miners.

AUDIT RESULT

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	PASS
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	PASS
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	PASS
Floating Pragma	SWC-103	Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.	ISSUE FOUND
Unchecked Call Return Value	SWC-104	The return value of a message call should be checked.	PASS
Unprotected Ether Withdrawal	SWC-105	Due to missing or insufficient access controls, malicious parties can withdraw from the contract.	PASS
SELFDESTRUCT Instruction	SWC-106	The contract should not be self-destructible while it has funds belonging to users.	PASS
Reentrancy	SWC-107	Check effect interaction pattern should be followed if the code performs recursive call.	PASS
Uninitialized Storage Pointer	SWC-109	Uninitialized local storage variables can point to unexpected storage locations in the contract.	PASS
Assert Violation	SWC-110 SWC-123	Properly functioning code should never reach a failing assert statement.	PASS
Deprecated Solidity Functions	SWC-111	Deprecated built-in functions should never be used.	PASS
Delegate call to Untrusted Callee	SWC-112	Delegatecalls should only be allowed to trusted addresses.	PASS

DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	PASS
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	PASS
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	PASS
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	PASS
Signature Unique ID	SWC-117 SWC-121 SWC-122	Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	PASS
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	PASS
Shadowing State Variable	SWC-119	State variables should not be shadowed.	PASS
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	ISSUE FOUND
Write to Arbitrary Storage Location	SWC-124	The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	PASS
Incorrect Inheritance Order	SWC-125	When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/.	PASS
Insufficient Gas Griefing	SWC-126	Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract.	PASS
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	PASS

Typographical Error	SWC-129	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	PASS
Override control character	SWC-130	Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.	PASS
Unused variables	SWC-131 SWC-135	Unused variables are allowed in Solidity and they do not pose a direct security issue.	PASS
Unexpected Ether balance	SWC-132	Contracts can behave erroneously when they strictly assume a specific Ether balance.	PASS
Hash Collisions Variable	SWC-133	Using abi.encodePacked() with multiple variable length arguments can, in certain situations, lead to a hash collision.	PASS
Hardcoded gas amount	SWC-134	The transfer() and send() functions forward a fixed amount of 2300 gas.	PASS
Unencrypted Private Data	SWC-136	It is a common misconception that private type variables cannot be read.	PASS

SMART CONTRACT ANALYSIS

Started	Sunday Jun 20 2021 23:08:08 GMT+0000 (Coordinated Universal Time)
Finished	Monday Jun 21 2021 19:23:02 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	spheriumToken.sol

Detected Issues

ID	Title	Severity	Status
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
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SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-120	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	low	acknowledged
SWC-120	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	low	acknowledged

SWC-120	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	low	acknowledged

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 9

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
8
9   pragma solidity ^0.8.0;
10
11   /*
12   * @dev Provides information about the current execution context, including the
13
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 36

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
35
36   pragma solidity ^0.8.0;
37
38   /**
39   * @dev Contract module which provides a basic access control mechanism, where
40
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 106

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
105
106   pragma solidity ^0.8.0;
107
108   /**
109   * @dev Interface of the ERC20 standard as defined in the EIP.
110
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 186

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
185
186   pragma solidity ^0.8.0;
187
188
189   /**
190
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 215

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
214
215   pragma solidity ^0.8.0;
216
217
218
219
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 521

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
520
521   pragma solidity ^0.8.0;
522
523
524   /**
525
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 559

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
558
559   pragma solidity ^0.8.0;
560
561   /**
562   * @dev Wrappers over Solidity's arithmetic operations with added overflow
563
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 776

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
775
776   pragma solidity ^0.8.0;
777
778
779
780
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 784

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
783
784   pragma solidity ^0.8.0;
785
786   interface ILiquidityProtectionService {
787   event Blocked(address pool, address trader, string trap);
788
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 818

low SEVERITY

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- spheriumToken.sol

Locations

```
817
818   pragma solidity ^0.8.0;
819
820   abstract contract UsingLiquidityProtectionService {
821   bool private protected = true;
822
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 939

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- spheriumToken.sol

Locations

```
938   function blockPassed(uint _block) internal view returns(bool) {
939   return _block < block.number;
940   }
941
942   function passed(uint _timestamp) internal view returns(bool) {
943
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1122

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- spheriumToken.sol

Locations

```
1121   {
1122   require(blockNumber < block.number, "SPHRI::getPriorVotes: not yet determined");
1123
1124   uint32 nCheckpoints = numCheckpoints[account];
1125   if (nCheckpoints == 0) {
1126
```

SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1195

low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- spheriumToken.sol

Locations

```
1194   {
1195   uint32 blockNumber = safe32(block.number, "SPHRI::_writeCheckpoint: block number
exceeds 32 bits");
1196
1197   if (nCheckpoints > 0 && checkpoints[delegatee][nCheckpoints - 1].fromBlock ==
blockNumber) {
1198   checkpoints[delegatee][nCheckpoints - 1].votes = newVotes;
1199
```

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This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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